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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,452	04/16/2001	Karl Reimer	23541-7002	5862
22854	7590	03/08/2004	EXAMINER	
MOORE, HANSEN & SUMNER 2900 WELLS FARGO CENTER 90 SOUTH SEVENTH STREET MINNEAPOLIS, MN 55402			WONG, EDNA	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 03/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/836,452

Applicant(s)

REIMER, KARL

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 92-115 and 119-124 is/are pending in the application.
- 4a) Of the above claim(s) 1-91 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 92-115 and 119-124 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

This is in response to the Amendment dated February 12, 2004. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Specification

The disclosure has been objected to because of minor informalities.

The objection to the disclosure has been withdrawn in view of Applicant's amendment.

Claim Objections

Claims **99 and 100** have been objected to because of minor informalities.

The objection to claims 99 and 100 has been withdrawn in view of Applicant's amendment.

Claim Rejections - 35 USC § 112

Claims **98, 116 and 117** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 98, 116 and 117 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicant's amendment.

Claim Rejections - 35 USC § 103

I. Claims **92-114** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Elliott et al.** (US Patent No. 5,669,979).

The rejection of claims 92-144 under 35 U.S.C. 103(a) as being unpatentable over Elliott et al. is as applied in the Office Action dated August 14, 2003 and incorporated herein. The rejection has been maintained for the following reasons:

Applicant states that Elliott does not disclose the use of an electromagnetic radiation source that generates ultraviolet radiation to which a substrate is exposed. In response, claim 92 as presently written does not require that the electromagnetic radiation source generates ultraviolet radiation. Thus, claim 92 is not distinguished from the prior art.

Applicant states that Elliott teaches only careful use of the ultraviolet radiation to ablate particles on a surface which is being cleaned according to the method. In response, claim 92 as presently written does not require a specific intensity of the electromagnetic radiation source, and cleaning the substrate is a modification of the substrate by exposure to the active zone.

Elliott teaches that the phrase "surface cleaning" or "surface processing" broadly includes, among other things, any removal of foreign material from a surface, surface state changes (e.g., hydrogen ion termination), moisture removal, surface priming (e.g., for photoresist adhesion), and deoxidation (col. 1, lines 36-40). Thus, claim 92 is not

distinguished from the prior art.

Furthermore, modification of the substrate by surface cleaning would have prepared the surface for adherence of an adhesive material thereto.

Applicant states that when Elliott disclosed the use of such an energy density, the disclosure does not indicate delivering such an intensity of electromagnetic radiation to the surface of the substrate, but rather a much lower energy intensity so as to be in a much lower range of electromagnetic radiation. In response, claim 92 as presently written does not require any specific energy intensity from the electromagnetic radiation source.

Furthermore, the energy intensity is a result-effective variable and one skilled in the art has the skill to calculate the energy intensity that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

It appears that one having ordinary skill in the art has the skill to adjust the energy intensity of the electromagnetic radiation source to radiate a metal substrate and plastic substrate. It does not appear that the same energy intensity would have been applied to both.

Also, it appears that one having ordinary skill in the art has the skill to adjust the energy intensity of the electromagnetic radiation source to etch or clean a metal substrate and plastic substrate. It does not appear that the same energy intensity would

have been applied to both.

Applicant states that Elliott teaches attacking the foreign material with radiation from the side, at an oblique angle to the substrate surface, not from the top at an angle much closure to perpendicular to the surface which would deliver a much greater intensity of radiation to the surface of the substrate. In response, claim 92 is opened to exposing the substrate to the active zone at an oblique angle.

Applicant states that Elliott teaches against the use of a substantially ambient pressure. In response, Elliott teaches that the atmospheric pressure in the vicinity of the foreign material may be raised or lowered above or below the ambient (col. 2, lines 33-35). It is deemed that substantially ambient pressure includes degrees above or below the ambient.

Applicant states that the method of preparing a polymer substrate for adherence of an adhesive material thereto is distinguished over Elliott. In response, claim 92 as presently written does not require a polymer substrate.

Applicant states that the method of preparing a substrate including a sole of a shoe is not disclosed by Elliot et al. In response, plastic, whether from a sole of a shoe or from small plastic optical fibers used for non-invasive surgery, is plastic. No

unexpected results are seen in how the shape of the plastic affects the process.

Furthermore, the sole of a shoe can be made of many different materials (not always a polymer) [e.g., plastic, wood, cork, leather, or rubber, etc.].

Applicant states that the creation of an intensity of electromagnetic radiation at the surface of the substrate in a range from about 2.0 J/cm^2 to about 5000 J/cm^2 is not disclosed by Elliott because Elliott delivers only up to 2000 mJ/cm^2 in the vicinity of the surface of a substrate to be cleaned at an oblique angle of incidence which will clearly reduce the intensity of electromagnetic radiation at the surface of the substrate. In response, 2000 mJ/cm^2 is 2.0 J/cm^2 . Thus, Elliott teaches the claimed intensity. The present claims are also open to delivering the electromagnetic radiation at an oblique angle of incidence.

Applicant states that Elliott does not disclose an intensity of the electromagnetic radiation of the surface of the substrate ranging from about 10 J/cm^2 to about 1000 J/cm^2 . In response, the intensity is a result-effective variable and one skilled in the art has the skill to calculate the intensity that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

It appears that one having ordinary skill in the art would have had the skill to adjust the energy intensity of the electromagnetic radiation source to radiate a metal substrate and plastic substrate. It does not appear that the same energy intensity would

have been applied to both.

Also, it appears that one having ordinary skill in the art would have had the skill to adjust the energy intensity of the electromagnetic radiation source to etch or clean a metal substrate and plastic substrate. It does not appear that the same energy intensity would have been applied to both.

Applicant states that using the method in association with a conveyor system would not be obvious to one skilled in the art and is distinguished from the art presently cited in the present application. In response, Elliott teaches pulling something through the cleaning chamber in the shape of a film, wire, strip or tape which may or may not be cut into individual pieces after cleaning, or a series of tile like pieces which are either pushed through the process chamber or transported through it on a conveyor like apparatus (col. 26, lines 56-67). Elliott's method is in association with a conveyor system.

II. Claims **115-120** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Elliott et al.** (US Patent No. 5,669,979).

The rejection of claims 115-120 under 35 U.S.C. 103(a) as being unpatentable over Elliott et al. has been withdrawn in view of Applicant's amendment.

Response to Amendment

Claim Objections

Claims **103, 119, 122 and 124** are objected to because of the following informalities:

Claim 103

line 2, the word "steps" should be amended to the word -- step --.

Claim 119

line 2, the word "of" should be deleted.

Claim 122

line 2, the word "purposed" should be amended to the word -- purpose --.

Claim 124

line 1, the word "step" should be amended to the word -- steps --.

line 2, the word -- and -- should be inserted after the word "device;".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

I. Claim **124** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 124

lines 1-5, "the step of exposing the surface of the substrate to a further radiation generated by an electro-ionization device; circulating a first gas stream past the electro-ionization device so that the first gas stream flows past the electro-ionization device and onto the surface of the substrate; wherein the further radiation is infra-red radiation".

Applicant's specification does not disclose circulating a first gas stream past the electro-ionization device so that the first gas stream flows past the electro-ionization device.

Applicant's specification discloses that the electro-ionization devices, such as the well-known corona discharge devices or atmospheric plasma devices, are used to generate ions by flowing a gas through a narrow gap bordered by two electrodes. An alternating high voltage is connected across the electrodes, producing a high voltage field across the gap which creates a corona discharge. This discharge, which is also

known as a "silent discharge" or "cold plasma discharge", converts a percentage of the gas to ions and other reactive species" (page 10, lines 23-31).

According to claim 124, the electro-ionization device irradiates infrared radiation. It does not appear that an electro-ionization device irradiating infrared radiation is the same as a corona discharge as disclosed in the specification.

II. Claims **111 and 112** are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for exposing the substrate to an infrared radiation source prior to or during the exposing step, does not reasonably provide enablement for exposing the substrate to an infrared radiation source after the exposing step. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

Applicant's specification discloses that "Another feature that may be incorporated in the invention to increase the treatment rate is to expose the substrate surface to infrared (IR) radiation to heat the upper most surface of the substrate in conjunction with the above UV or UV and electro-ionization exposure. This exposure may be imparted prior to or during the UV treatments" (page 12, lines 5-8). However, claim 111 as presently written is open to exposing the substrate to an infrared radiation source after the exposing step.

III. Claims **98-102, 107, 112, 115, 119-120 and 124** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 98

lines 1-2, "said electromagnetic radiation" lacks antecedent basis.

Claim 99

lines 1-2, "said electromagnetic radiation" lacks antecedent basis.

Claim 100

lines 1-2, "said electromagnetic radiation" lacks antecedent basis.

Claim 101

lines 1-2, "said electromagnetic radiation" lacks antecedent basis.

Claim 102

lines 1-2, "said electromagnetic radiation" lacks antecedent basis.

Claim 107

line 2, "the active zone adjacent to the conveyor system" lacks antecedent basis.

Claim 112

line 2, it appears that the “infra-red radiation” is the same as the infra-red radiation generated by the infra-red radiation source recited in claim 111, lines 3-4. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word “to” in line 2.

Claim 115

line 8, it appears that the “electromagnetic radiation” is the same as the electromagnetic radiation generated by said electro-magnetic radiation source recited in claim 115, lines 5-6. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word “to”.

line 10, “the polymer substrate” lacks antecedent basis. See also claim 115, lines 11-12.

Claim 124

line 3, “a first gas” lacks antecedent basis. There is no recitation of a second gas in order for there to be a first.

Claim Rejections - 35 USC § 103

Claims **121-124** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Elliott et al. (US Patent No. 5,669,979).

Elliott teaches a method for preparing a substrate, the method comprising the steps of:

(a) providing a conveyor system (= a conveyor like apparatus) including a conveyor and an electromagnetic radiation source **130** (col. 26, lines 56-67);

(b) generating an active zone **128** (= reaction zone) using an electromagnetic radiation source **130** (= laser beam = ultraviolet radiation) [col. 3, lines 2-5] wherein electromagnetic radiation generated by the electromagnetic radiation source is radiation having a wavelength in the range of about 150 nanometers to 250 nanometers (= 4 nm to 300 nm) [col. 3, lines 2-4; and Fig. 6]; and

(b) exposing the surface of the substrate to the electromagnetic radiation generated by the electromagnetic radiation source, wherein the intensity of said electromagnetic radiation at the surface of the substrate ranges from about 2.0 joules per square centimeter to about 5,000 joules per square centimeter (= $2000 \text{ mJ/cm}^2 = 2 \text{ J/cm}^2$) [col. 27, claim 1], whereby the substrate is modified (col. 1, lines 36-40) by exposing the surface to said active zone,

the step of exposing including conveying the substrate through said active zone, whereby the substrate is exposed to the active zone for a residence time.

The method further comprises the steps of exposing the surface of the substrate to a further radiation generated by an electro-ionization device **126** (= plasma discharge); and circulating a first gas stream **134** past the electro-ionization device so

that the first gas stream flows past the electro-ionization device and onto the surface of the substrate (col. 12, lines 48-64; and Fig. 6).

Elliott does not teach wherein the substrate is a polymer substrate.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of method of Elliott with wherein the substrate is a polymer substrate because Elliott teaches that a pellicle which includes a thin polymer membrane (col. 26, lines 2-18) and small plastic optical fibers used for non-invasive surgery (col. 26, lines 29-45) are treatable by his process. It appears that a plastic substrate of any shape (fiber, film, wire, strip, tape, tile-like pieces, etc.) is suggested by the teachings of Elliott.

References are evaluated by what they collectively suggest to one versed in the art, rather than by their specific disclosures. *In re Simon* 174 USPQ 114 (CCPA 1972); *In re Richman* 165 USPQ 509, 514 (CCPA 1970).

As to modified for adhering a material including an adhesive onto the surface of the polymer substrate, this is the result of the exposing step.

Similar processes can reasonably be expected to yield products which inherently have the same properties. *In re Spada* 15 USPQ 2d 1655 (CAFC 1990); *In re DeBlauwe* 222 USPQ 191; *In re Wiegand* 86 USPQ 155 (CCPA 195).

As to wherein the active zone is at substantially atmospheric pressure, the pressure is a result-effective variable and one skilled in the art has the skill to calculate the pressure that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Furthermore, Elliott teaches that the atmospheric pressure in the vicinity of the foreign material may be raised or lowered above or below the ambient (col. 2, lines 33-35). It is deemed that substantially atmospheric pressure includes degrees above or below the ambient.

As to the step of adhering a material including an adhesive onto the surface of the polymer substrate for the purpose of bonding the material to the substrate, Elliott teaches that the phrase "surface cleaning" or "surface processing" broadly includes, among other things, any removal of foreign material from a surface, surface state changes (e.g., hydrogen ion termination), moisture removal, surface priming (e.g., for photoresist adhesion), and deoxidation (col. 1, lines 36-40). It appears that the teachings of Elliott would have suggested that the surface is primed for adhering a material which can include an adhesive, depending upon what is desired.

As to the step of evacuating the active zone adjacent to the conveyor system, Elliott teaches the removal of the cloud (entraining gas flow, vacuum exhaust) [col. 6, lines 21-22]. It appears that the teachings of Elliott would have suggested that the active

zone adjacent to the conveyor system would have been evacuated if the cloud was removed.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

Claims **115 and 119-120** define over the prior art of record because the prior art does not teach or suggest a method of preparing a substrate for adherence of an adhesive material thereto, the substrate having a surface, the method comprising the steps of generating and exposing as presently claimed, esp., wherein the substrate is a polymer substrate and wherein the intensity of the electromagnetic radiation at the surface of the substrate ranges from about 10 J/cm² to 1000 J/cm².

The prior art does not contain any language that teaches or suggests the above. Therefore, a person skilled in the art would not have been motivated to adopt the above conditions, and a prima facie case of obviousness cannot be established.

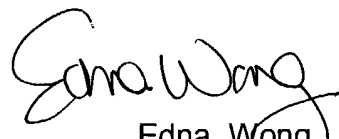
Claims 115 and 119-120 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt.

Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Edna Wong
Primary Examiner
Art Unit 1753

EW
February 29, 2004